Rewarding Learning

Centre Number

71	

Candidate Number

General Certificate of Secondary Education
2011–2012

Science: Double Award (Modular)

Living Organisms and the Processes of Life
End of Module Test
Higher Tier

A

[GDA02]

GDA02

TUESDAY 8 NOVEMBER 2011
1.30 pm–2.15 pm

TIME

45 minutes.

INSTRUCTIONS TO CANDIDATES

Write your Centre Number and Candidate Number in the spaces provided at the top of this page.
Write your answers in the spaces provided in this question paper.
Answer **all thirteen** questions.

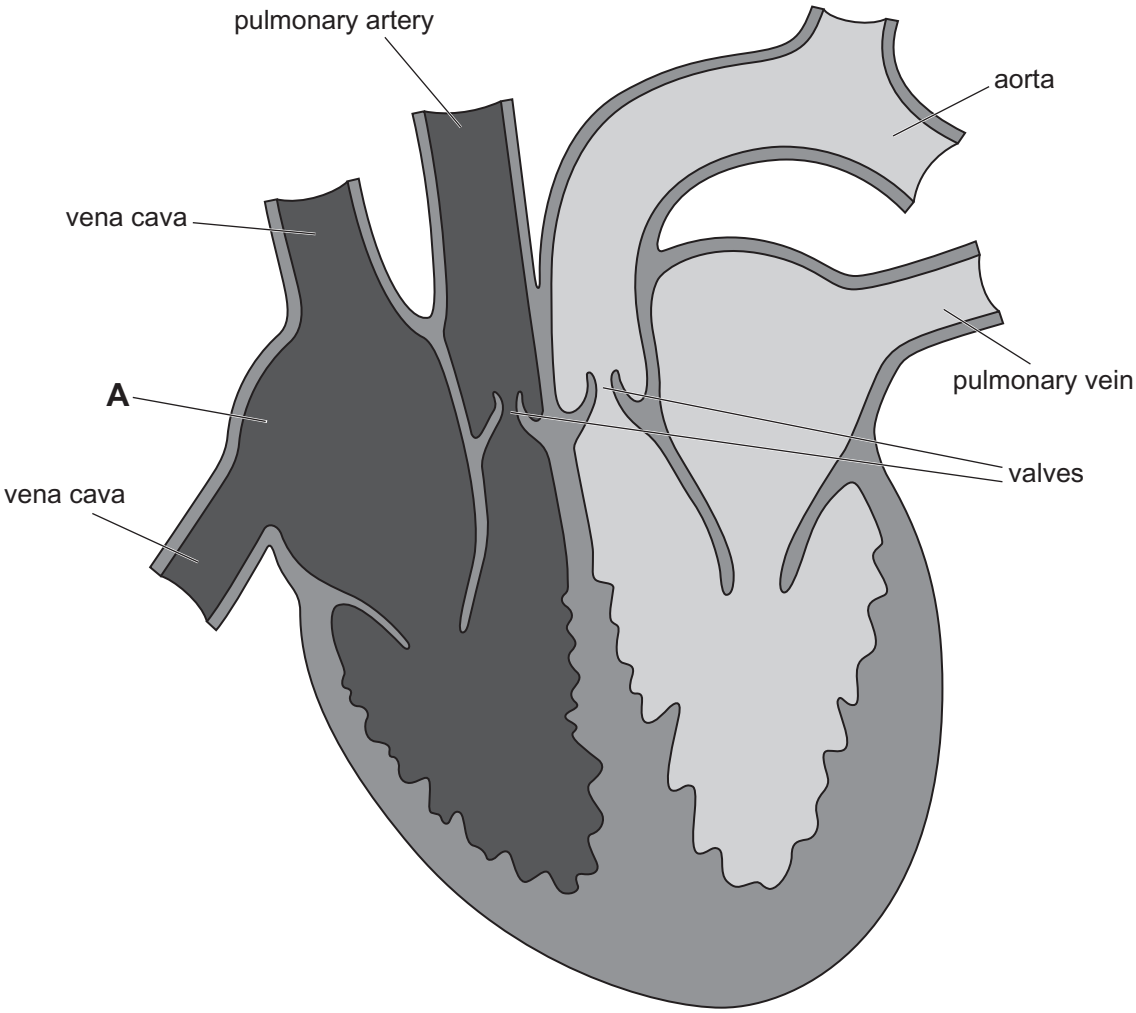
INFORMATION FOR CANDIDATES

The total mark for this paper is 50.
Figures in brackets printed down the right-hand side of pages indicate the marks awarded to each question or part question.

For Examiner's use only	
Question Number	Marks
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	
11	
12	
13	
Total Marks	

Examiner Only	
Marks	Remark

1 The diagram shows a section through the human heart.



(a) Name the heart chamber labelled **A**.

_____ [1]

(b) Use the diagram to name the two blood vessels that carry oxygenated blood.

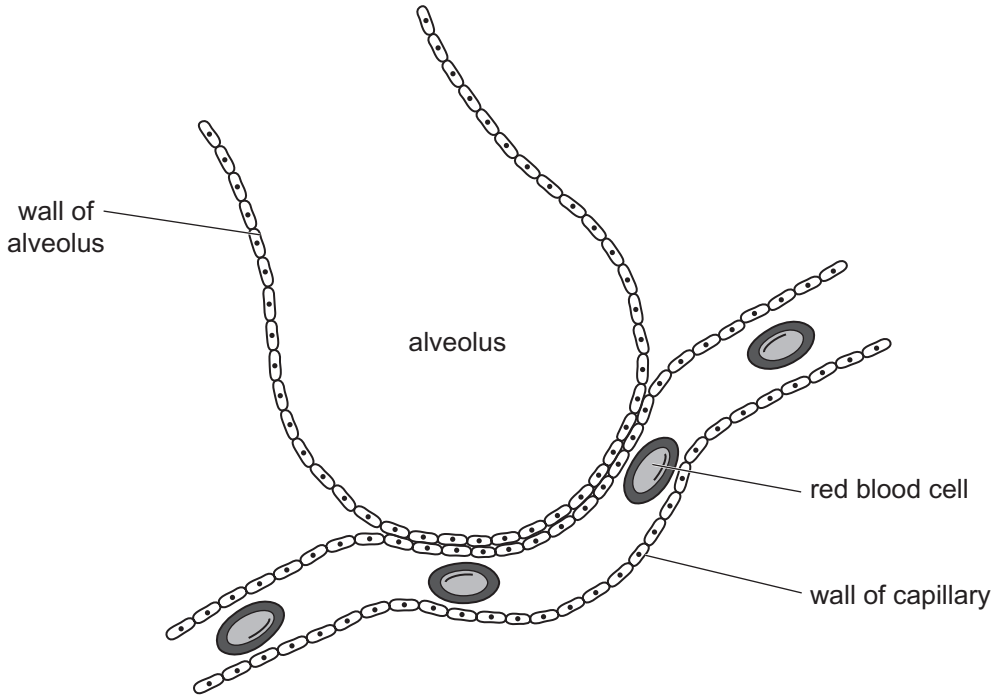
1. _____

2. _____ [2]

(c) Suggest a function for the presence of the valves in the pulmonary artery and the aorta.

_____ [1]

2 The diagram shows an alveolus with its associated capillary.



(a) Use the diagram to state one feature about the wall of the alveolus that helps gas exchange.

_____ [1]

(b) Name the gas that diffuses from the alveolus into the red blood cells.

_____ [1]

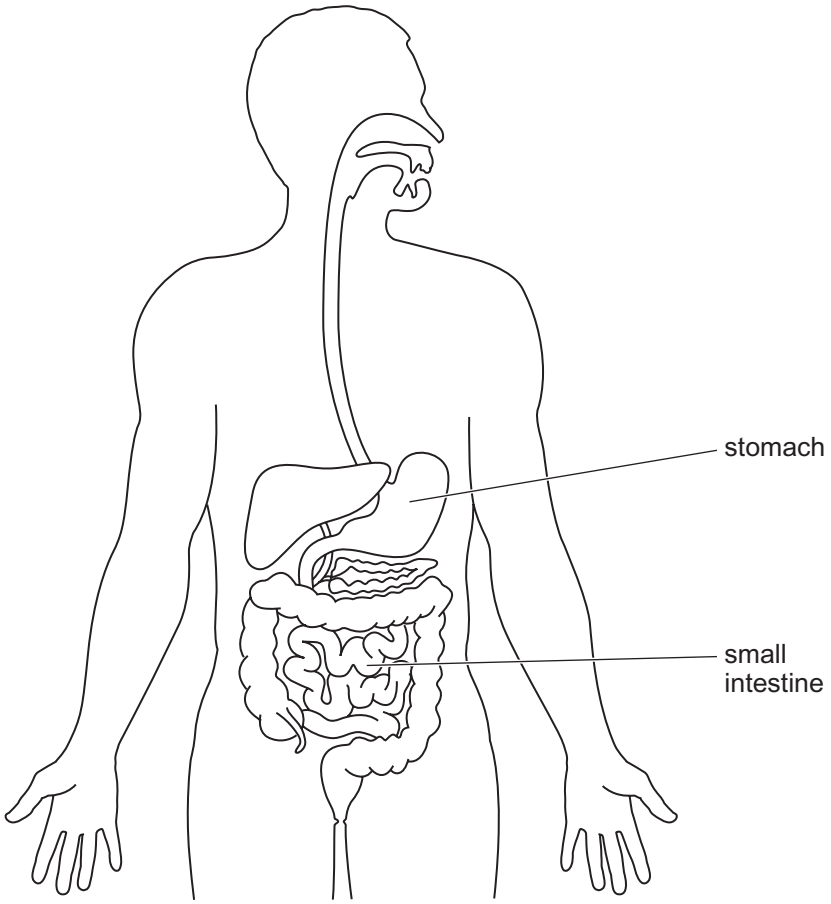
(c) Explain how having millions of alveoli in the lung facilitates gas exchange.

_____ [1]

Examiner Only	
Marks	Remark

Examiner Only	
Marks	Remark

3 The diagram shows the digestive system.



(a) What type of digestive enzyme is present in the stomach?

_____ [1]

(b) Describe one way, **not visible in the diagram**, in which the small intestine is adapted for absorption.

_____ [1]

(c) Name the organ that digested food molecules such as amino acids and glucose are taken to immediately after being absorbed.

_____ [1]

4 **(a)** Give an example of a disease caused by a fungus.

_____ [1]

(b) Complete the table below about active and passive immunity.

Type of immunity	Source of antibodies
Active immunity	
Passive immunity	

[2]

(c) Explain why active immunity is described as long-term, whereas passive immunity is only short-term.

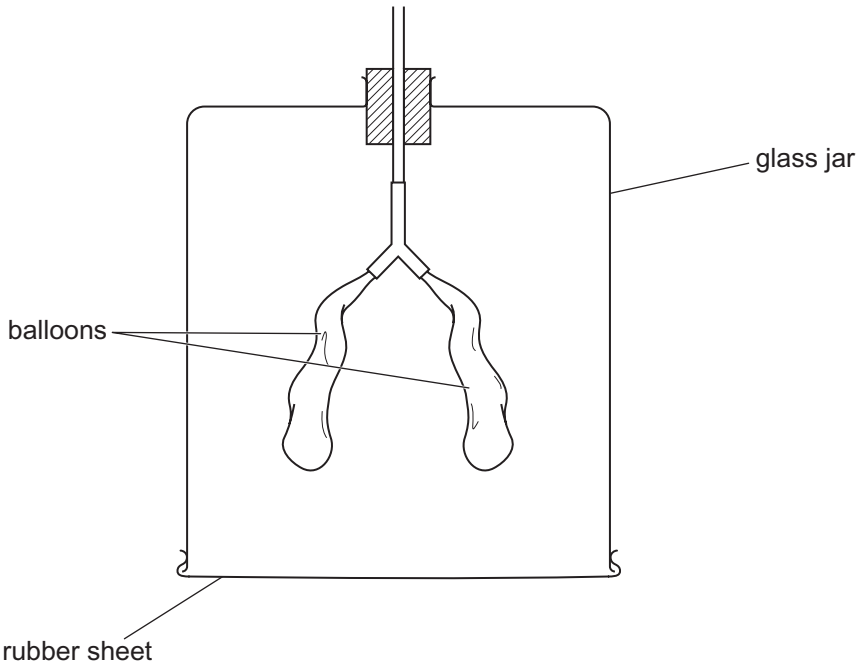
_____ [1]

Examiner Only

Marks	Remark

Examiner Only	
Marks	Remark

5 The diagram shows apparatus that can be used to demonstrate breathing in a human.



(a) What structure does the rubber sheet represent?

_____ [1]

(b) Explain why the balloons inflate when the rubber sheet is pulled down.

_____

_____ [2]

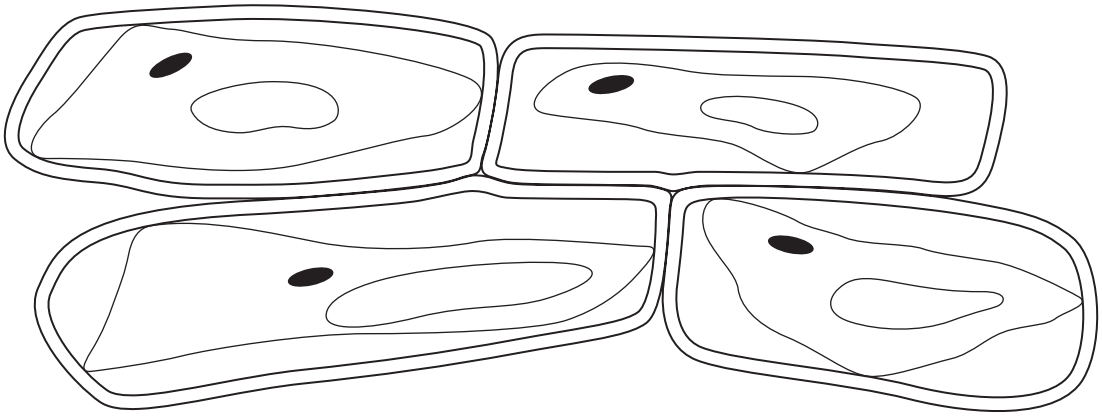
(c) Describe one way in which the balloons, shown in the diagram, do not accurately represent the structure of the lungs.

_____ [1]

Examiner Only	
Marks	Remark

6 Jenny placed onion epidermis cells in a 10% sugar solution and examined a section of them using a microscope.

Some of the cells are shown below.

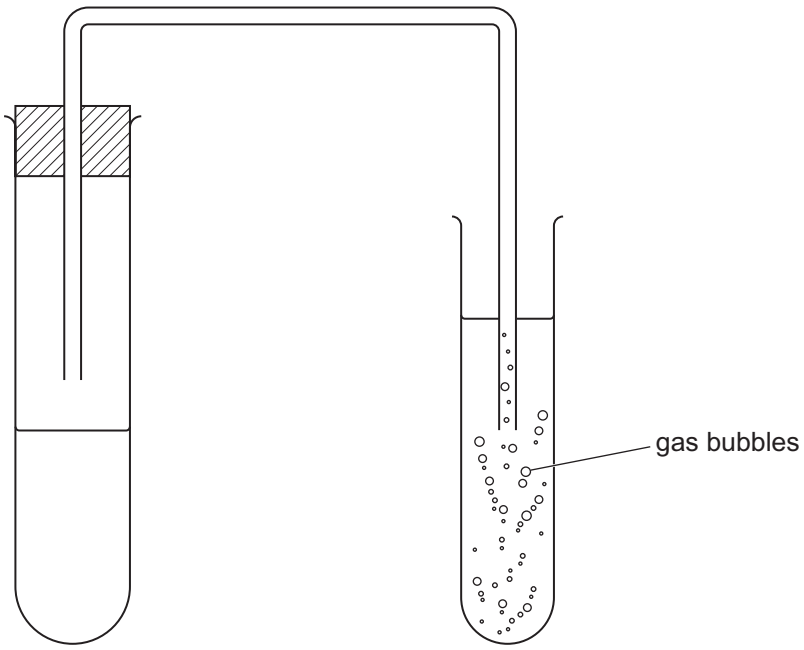


Describe and explain the appearance of these cells.

[4]

Examiner Only	
Marks	Remark

7 The diagram shows the apparatus used to investigate anaerobic respiration in yeast.



(a) In addition to yeast, name two other substances that are added to boiling tube A.

1. _____

2. _____ [2]

(b) Name the gas forming the bubbles in test tube B.

_____ [1]

(c) Apart from the gas, name one other substance produced in anaerobic respiration.

_____ [1]

Examiner Only	
Marks	Remark

8 Environmental factors may affect the rate of photosynthesis in plants.

(a) Explain what a limiting factor is and suggest what would be the limiting factor in a field of winter wheat in January.

_____

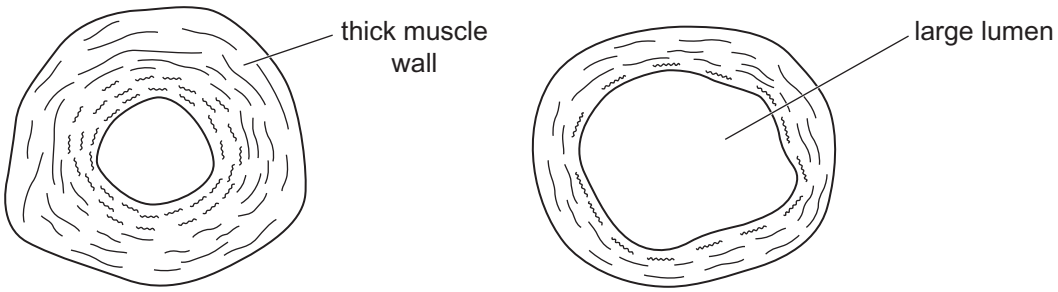
_____

_____ [2]

(b) What factor would you expect to be limiting in a field of potatoes on a sunny day in summer?

_____ [1]

9 The diagram shows a cross-section through an artery and a vein.



artery **vein**

(a) Explain why the artery has a thick muscle wall.

_____ [1]

(b) Suggest why the vein has a large lumen.

_____

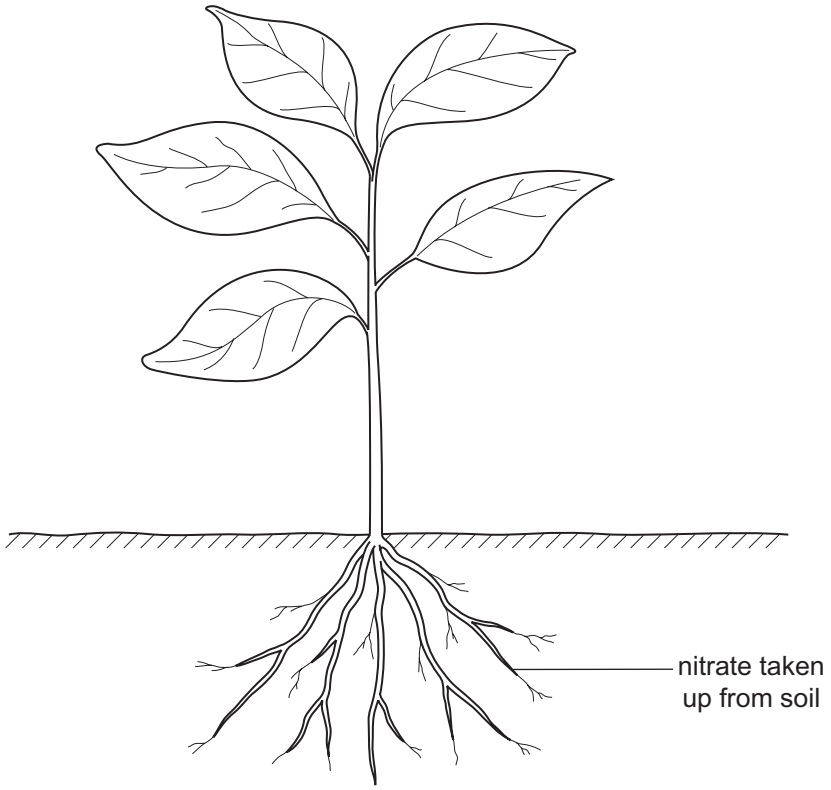
_____ [1]

(c) State the way in which the hepatic portal vein differs from other veins.

_____ [1]

10 The diagram below shows where nitrates enter a plant.

Examiner Only	
Marks	Remark



(a) Describe the role that nitrates play in plant growth.

_____ [1]

(b) Explain how nitrates are taken up from the soil.

_____

_____

_____

_____ [3]

(c) Nitrates move up through a plant in the xylem vessels. The nitrates move through the plant faster on warm days compared to cold days. Explain why.

_____ [1]

11 Urea is a waste product made in our body. It is toxic and needs to be removed.

Examiner Only	
Marks	Remark

(a) Where in the body is urea produced?

_____ [1]

(b) Explain how the kidneys remove urea from the body and describe the route urea follows from the kidneys to its elimination from the body in urine.

_____

_____

_____

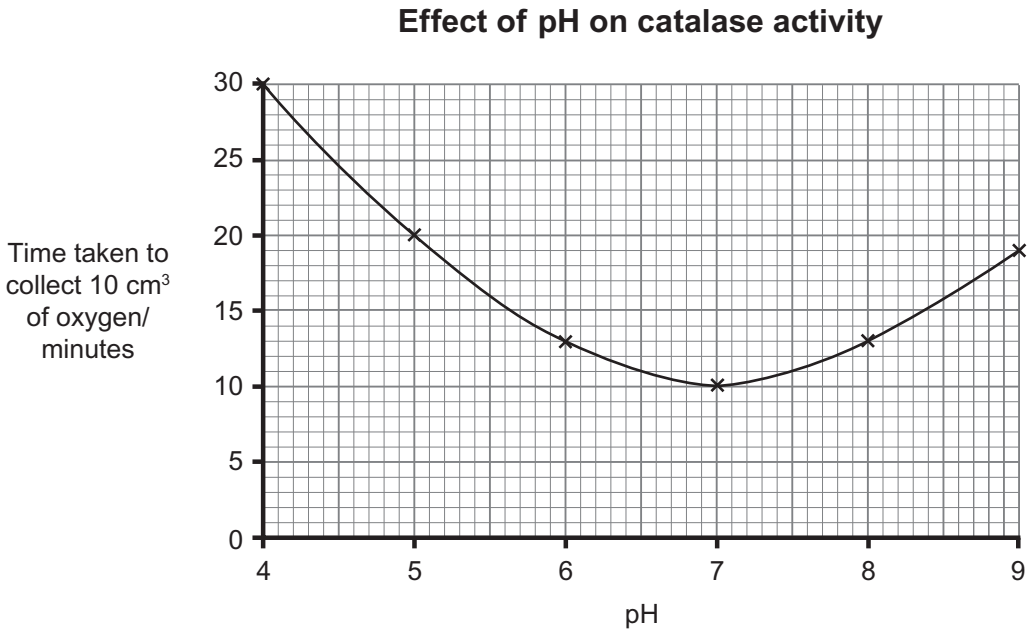
_____ [3]

Examiner Only	
Marks	Remark

12 James is investigating the effect of pH on an enzyme called catalase.

Catalase breaks down hydrogen peroxide into water and oxygen.

James measures the time it takes to collect 10 cm^3 of oxygen at a range of pH values. His results are shown in the graph.



Use the graph and your knowledge to answer parts **(a)(i)–(ii)**.

(a) (i) What is the optimum pH for catalase?

_____ [1]

(ii) Explain the result at pH 4.

_____

_____ [2]

(b) Describe the digestion of fats.

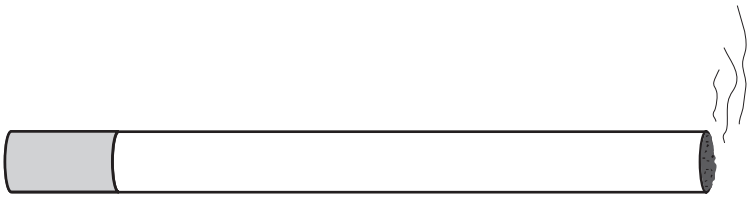
_____

_____

_____ [2]

Examiner Only	
Marks	Remark

13 Smoking cigarettes results in the gas carbon monoxide being absorbed into the bloodstream.



(a) Suggest how the presence of this gas in the mother's blood can result in a smaller than average baby being born.

_____

_____

_____ [2]

(b) Tar from cigarettes clogs up the cilia in the respiratory tract and the cilia stop beating. Explain the effect of this on the body.

_____

_____

_____ [2]

THIS IS THE END OF THE QUESTION PAPER